

Jeppé Skott

The Goldilocks Principle revisited: Balancing "proving that" and "proving why" in mathematics teacher education

Many teachers face difficulties with reasoning and proving, especially when they support their students' work with these mathematical practices. I outline the background to a planned development project in primary/lower secondary teacher education that seeks to alleviate these difficulties. I argue that the project needs to deal with reasoning and proving in problem contexts that are 'sufficiently close' both to the challenges teachers encounter in mathematics classrooms and to the practices of reasoning and proving in the discipline of mathematics. This is uncontentious, as much recent scholarship on mathematics teacher education argues for the need to balance school mathematics and academic mathematics. A more specific (and possibly more contentious) suggestion is that, in the case of mathematical reasoning, this means balancing "proving that" and "proving why" in ways that build on the mathematical complexities of tasks that are used in school mathematics. To make my argument I draw on a conceptual framework called Patterns of Participation (PoP). PoP views teachers' acts and meaning making as their (re-)engagement in other past and present practices in view of the interactions that unfold in the classroom rather than as their enactment of reified knowledge and beliefs. I use PoP-interpretations of classroom episodes to exemplify both the challenges teachers face when dealing with mathematical reasoning and the tasks that may be used in mathematics teacher education. However, my paper is not an empirical piece in the usual sense, but an empirically informed theoretical essay that outlines the background to the development project.

Keywords: Mathematical reasoning, mathematics teacher education, Patterns of Participation